Journal of Physics: Conference Series 2016 vol.669 N1

Acoustic disturbances in a gas with an axial temperature gradient

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Abstract

Linear analysis acoustic disturbances in one-dimensional gas flow with a longitudinal gradient of the sound speed provided. Known wave equation for the acoustic velocity is used. In the case of linear distribution of the sound speed in the hot part of the flow equation has an exact analytic solution. This allows to define the expression describing the propagation acoustic disturbances in a gas with varying mean temperature and density. The results can be used to calculate the resonance frequencies of the gas oscillations in the laboratory and industrial combustors.

http://dx.doi.org/10.1088/1742-6596/669/1/012036